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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/060,068

01/29/2002

Ubaldo Mastromatteo

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10/20/2004

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EXAMINER

RAO, SHRINIVAS H

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/060,068

Applicant(s)

MASTROMATTEO, UBALDO

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-20 and 27-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) 13-20 and 27-45 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of paper submitted under 37 CFR 1.114 claiming priority from U.S. Serial No. 10/060068 filed on 01/29/2002 which itself claims priority under 35 U.S.C. 119(a)-(d), from Italian Patent Application No. TO 20014000086 filed on) 1/30/2001 which papers have been placed of record in the file.

Continued Prosecution Application

The request filed on 9/02/2004 for a Request for Continued Examination Application (RCE) under 37 CFR 1.114(d) based on parent Application No. 10/060068 is acceptable and a RCE has been established. An action on the RCE follows.

Information Disclosure Statement

No IDS to date has been filed in the instant Application.

Preliminary Amendment Status

No preliminary amendment accompanying the RCE has been filed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13,-18, 27-30, 43 to 45 are rejected under 35 U.S.C. 102(b) as being anticipated by Chao et al. (U.S. Patent .No. 5,633,535 herein after Chao).

With respect to claims 13, 27 and 43 to 45 Chao describes a device formed by a first body of semiconductor material (Chao 10) and a second body welded together through a mechanical and electrical connection structure, (Chao 20) comprising: an electrically conductive region welded between said first body (Chao fig. 5 # 42 conductive region, # 10 –first body) and said second body (fig. 5 # 20 –second body) ; and a spacing region arranged near said electrically conductive region and surrounding an active region .(fig. 5 # 40, col. 4 line 33) the spacer defining an enclosed space between the first and second bodies (or surrounding more than half of an active region, or at least two contiguous sides of an active region) (or surrounding at least three sides an active region) (Chao figs. 6-8 etc. 40 defining enclosed space between them).

With respect to claims 14 and 28 describes the device according to claim 13, wherein said electrically conductive region is of a low-melting eutectic material.

With respect to claim 15 describes the device according to claim 14, wherein said low-melting eutectic material is formed by alternating layers of gold and tin.

With respect to claims 16 describes the device according to claim 13, wherein said spacing region is of dielectric material. (Chao col. 4 lines 40 to 65)

With respect to claim 17 describes the device according to claim 16, wherein said dielectric material is chosen from among a spun polymer, such as SUB, polyimide, a

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composite material formed by laminated polymer layers, such as a photosensitive stick foil, and oxynitrides. (Chao col. 66-67).

With respect to claim 18 describes the device according to claim 13, wherein said spacing region forms a delimiting cavity surrounding said electrically conductive region.

(Chao figure 6, etc.)

With respect to claim 29 describes the device of claim 27 wherein the first and second metal regions and the connection structure are formed within the enclosed space defined by the spacer . (Chao figure 6, etc., 42 metal regions and connection structure 43 are formed within space defined by spacers 40).

With respect to claim 30 describes the device of claim 27 wherein a micromechanical structure is formed within the enclosed space defined by the spacer . (Chao figures 4 A and B, 6 etc. part of substrate having printed circuit board).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19-20 and 31 are rejected under 35 U.S. C. 103 over Chao et al. (U.S. Patent No. 5,633,535, herein after Chao) as applied to claims 13-18 , etc. above and further in view of Yew et al. (U.S. Patent No. 6,137,164, herein after Yew).

With respect to claim 19, Chao describes the device according to claim 13.

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Chao does not specifically describe the device comprising a metal region which extends on top of said second body and beneath said electrically conductive region.

However Yew in figures 5,8 etc. describes metal regions extending on top of second body and beneath the electrically conductive region to form interconnections to perimeter vias for a first and second integrated chip of different sizes and functions and to form self aligned plural bodies during bonding.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Yew's metal regions extending on top of second body and beneath the electrically conductive region in Chao's device to form interconnections to the perimeter vias for a first and second integrated chip of different sizes and functions and to form self aligned plural bodies during bonding. (yew col. 4 lines 8 to 15).

With respect to claim 20 describes the device according to claim 19, wherein said welding region and said metal region are of a material chosen from among titanium, gold and nickel. (well known in the art).

With respect to claim 31 describes the device of claim 27 wherein the first body of semiconductor material is formed of quartz. (well known in the art).

Claims 32-38 are rejected under 35 U.S. C. 103 over Chao et al. (U.S. Patent No. 5,633,535, herein after Chao) and Yew et al. (U.S. Patent No. 6,137,164, herein after Yew) as applied to the claims above and further in view of Duboz et al. (U.S. Patent No. 5,726, 500 herein after Duboz).

With respect to claim 32 Chao and Yew describe the device of claim 31

Chao and Yew do not specifically describe the device further comprising a mirror formed on a second surface of the first body.

However Duboz in col.4 lines 29-32, etc. describes the device further comprising a mirror formed on a second surface of the first body as part of the photo sensitive element of the photodiode when the electronic circuit forma part of an infrared detector, etc.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Duboz's device including the mirror in Chao and Yew's device to form the photo sensitive element of the photodiode when the electronic circuit forma part of an infrared detector, etc. (Duboz col. 4 lines 29-32, col. 5 lines 45-50).

With respect to claim 33 describes the device of claim 31, further comprising a diffractive lens formed on the second surface of the first body. (Duboz col. 5 lines 10-17).

With respect to claims 34-36, Chao describes the device of claim 31 wherein it comprises an electromechanical (Chao 42), fluid (Duboz col. 5 lines 10-17). and optical system (Duboz in col.4 lines 29-32).

With respect to claim 37, Chao describes the device of claim 36, further comprising a mirror formed on a surface of the first body opposite the optical structure. (Duboz col. 4 lines 29-32) .

With respect to Claim 28, Chao describes the device of claim 36 , further comprising a third body (Chao figures 4 5, third 42) welded to first body (welded to 10) adjacent to the second body (42 adjacent to second 42) and a spacing region formed

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between the first and third bodies and surrounding an additional active region. (figures 4,5) .

With respect to claim 39 the device of claim 38 further comprising first and second mirrors formed on opposite faces of the first body. (Duboz figure 5)

With respect to claim 40 , Chao describes the device of claim 13, wherein the first and second bodies are wafers of semiconductor material. (Duboz figure 1 10-GaAs, 15-silicon).

With respect to claim 41, Chao describes the device of claim 13, wherein the spacing region completely surrounds the active region. (Chao, Yew fig 4a, 6A etc.) .

Response to Arguments

Applicant's arguments filed 09/01/04 have been fully considered but they are not persuasive for the following reasons :

Applicants' first contention that Examiner acknowledges Chao's pedestals 40 cannot be interpreted as being anything other than simple spacers of an undefined shape and that no single one of them could be thought of as defining a region outside its own dimensions is completely at odds with the examiners position which was previously stated and reproduced below.

Applicants' first contention that that the term " surrounding " should be interpreted as " substantially or at least partially surrounds a region ". Is not persuasive because the same term cannot be used to provide different coverage in claims.

As the claims must be given the broadest possible interpretation the term " surrounding will be interpreted to mean " at least partially surrounds a region."

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Applicants' contention that Chao does not a spacing region surrounding an active region is not persuasive because according to above definition of "surrounding" (at least partially surrounds a region) it is clear from Chao figures (5-8 etc. that spacing region 40 at least partially surrounds a portion of the l/c (active region) of 10).

Applicants' have misunderstood and overstated the Examiner's position.

It is hoped the following explanation (provided for the second time) is enough for Applicants' to understand. It is noted that the Examiner's position needs to be clear to one skilled in the art and need not be explained until each and every Applicant understands it.

Applicants' are reminded that alleged distinguishing features must be recited in the claims to be given patentable weight. Applicants' definition from specification cannot be imported into claims when the same are not recited in the claims.

With respect to claim 27 Applicants' allege that Chao does not teach "a spacer defining an enclosed space between first and second bodies" is not persuasive because Chao in figures 6-8 describes an enclosed between spacers 40 and first and second bodies 10 and 20.

With respect to claims 31-33 Duboz in col. 4 lines 20-40 and col. 5 lines 35-55 describes infrared detectors and photosensitive materials and conductors transparent at the wavelength detected must be used all indicate that bodies of transparent material including glass, quartz (common form of glass) etc are used.

Further Duboz teaches several substrates including GaAs, hybrid, InP, HgCdTe, PBTc etc.

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Therefore all of Applicants' arguments are not considered persuasive.


Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5945. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.

Steven H. Rao

Patent Examiner

October 15, 2004.


PHAT X. CAO
PRIMARY EXAMINER